

CARDIOVASCULAR HOSPITAL ADMISSIONS IN RELATION TO AIRCRAFT NOISE, ROAD NOISE AND AIR POLLUTION IN WEST LONDON

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Background: There is increasing evidence that environmental noise exposure has a range of impacts on cardiovascular disease.

Methods: A small area study was conducted covering 12 local government districts in west London partly or wholly within the 2003 L_{day} 50 dBA Heathrow aircraft noise contour over the time period 2001-2005. Exposure variables were 2001 values for (i) aircraft noise for daytime $L_{eq,16hr}$ and nighttime L_{night} (ii) daytime road traffic noise $L_{eq,16hr}$ (Rd16) from maps produced to comply with the European Noise Directive 2002/49/EC and (iii) modelled annual average concentrations of NO_2 and PM_{10} . These were examined in relation to hospital admissions for cardiovascular disease for people living in the study area. Census output areas (COAs), which comprise 250 people on average in the UK, were chosen as the unit of analysis. A Bayesian disease mapping model was constructed using a log-linear model for the risk for each COA and accounting for spatial residuals using a conditionally autoregressive structure and a hierarchical structure for unstructured residuals. Results were adjusted for ethnicity structure of the area and deprivation (Carstairs index). Tests for linear and quadratic trends across categories were conducted using the median value of each noise or air pollution category.

Results: There were 2,616,448 million people resident in the study area in 2001 and 180,738 cardiovascular hospital admissions in 2001-5, giving approximately 4 person admissions per COA per year of study. Correlation coefficients were low between road traffic and aircraft noise ($r=0.018$ for Rd16 and aircraft $L_{eq,16hr}$) but moderate between road noise and NO_2 ($r=0.432$). NO_2 and PM_{10} were highly correlated ($r=0.952$). The correlation between daytime and night aircraft noise was 0.88. Analytic analyses have been completed and results are currently being evaluated.

Conclusions: This study is expected to influence policy planning for high volume airports in urban areas.